UCRL-JC-124386 Abs

Protection of the Target Positioner and Other Apparatus in Close Proximity to NIF Targets

L. Pittenger, G. DiPeso, R. Johannes, R. Managan, F. Serduke
Lawrence Livermore National Laboratory

P. Peterson
University of California, Berkeley

The illumination of targets in NIF yields soft X-rays at fluences sufficient to cause significant ablation of objects, such as the target positioner, which are located as close as 100 mm to the center of action. Ablation-launched shocks are estimated to have potentially damaging pressure pulses. Debris adds to the impact loading.

An ice-over-metallic foam scheme has been adopted for the protection of the positioner, and may be adapted to protect similarly threatened objects, typically diagnostic instruments. This selected combination minimizes adverse effects of ablated product on optics' debris shields and first wall coatings; and has the capability to absorb shock energy without creating additional debris.

Calculations to determine design parameters such as foam density and thickness are presented, as well as a design for the *in situ* formation of the ice layer and its maintenance during the pre-shot period.

This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under contract No. W-7405-Eng-48.